Olympic Region, Area 4

Integrated Roadside Vegetation Management Plan

2009

Washington State Department of Transportation
Maintenance and Operations Division

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Summary

This plan explains the Washington State Department of Transportation's (WSDOT) policy and practice for maintenance of roadside vegetation for Maintenance Area 4 within the agency's Olympic Region. This area manages vegetation within approximately 250 miles of state highway corridor in Grays Harbor and western portions of Mason and Thurston Counties. The major corridor in the area is State Route 8/12, which is the major connection between the Puget Sound basin and the Washington Coast. Other corridors include 85 miles of US 101, State Routes 12, 105, 107, 108, 109, and 115. A map of the area is included as **Figure 1** on the following page.

The primary objectives in maintenance of roadside vegetation within the area are in relation to safety of the highway users and control of legally designated noxious weeds where they occur on the right of way. Other considerations include the efficient and effective use of state resources, protection and preservation of natural environment, preserving and enhancing the natural scenic quality of the roadside, and being a good neighbor to the many adjoining property owners. In all cases, roadside vegetation maintenance activities are planned and conducted in a way that discourages or eliminates unwanted vegetation and promotes desirable vegetation. This is the basic premise of Integrated Vegetation Management (IVM) and the foundation of the program.

This document and associated information management tools serve as the primary reference for maintenance of roadside vegetation in the area. Included is detailed information on locations for reoccurring routine maintenance practices, reoccurring weed infestations, sensitive areas, and other areas with special management considerations. Also included are guidelines and prescriptions for best management practices in dealing with roadside vegetation problems and opportunities. In effect, this plan supports WSDOT's compliance with state law (RCW 17.15) by implementing the principles of Integrated Pest Management for the management of roadside vegetation. It also supports WSDOT's long-range goals for the management of roadsides to:

- Create naturally stable, sustainable plant communities
- Improve effectiveness and efficiency in the control of weeds and unwanted trees and brush
- Reduce maintenance cost and herbicide use over time

This plan is organized around the major categories of roadside vegetation maintenance work. The major categories include: Pavement Edge Maintenance, Routine Mowing, Noxious Weed Control, Nuisance Weed Control, Tree and Brush Control, and Special Maintenance Areas.

The management of roadside vegetation is a dynamic process and it is intended that this plan be continuously adapted over time based on input from a variety of sources. An integral component of this process is a database for recording IVM treatments for specific vegetation controls and locations, and to record information on follow up evaluation of these treatments. Annual area meetings will be held to discuss what is learned each year and refine the plan over time.

WSDOT is also requesting that local public and private entities with an interest in weed control and roadside vegetation management provide input on the plan and cooperate in efforts where appropriate. Copies of the complete draft plan are available online: www.wsdot.wa.gov/maintenance/vegetation/mgmt_plans.htm, hard copies can also be provided upon request. Please contact Randy Moody or Ray Willard at the numbers listed below for questions or comments:

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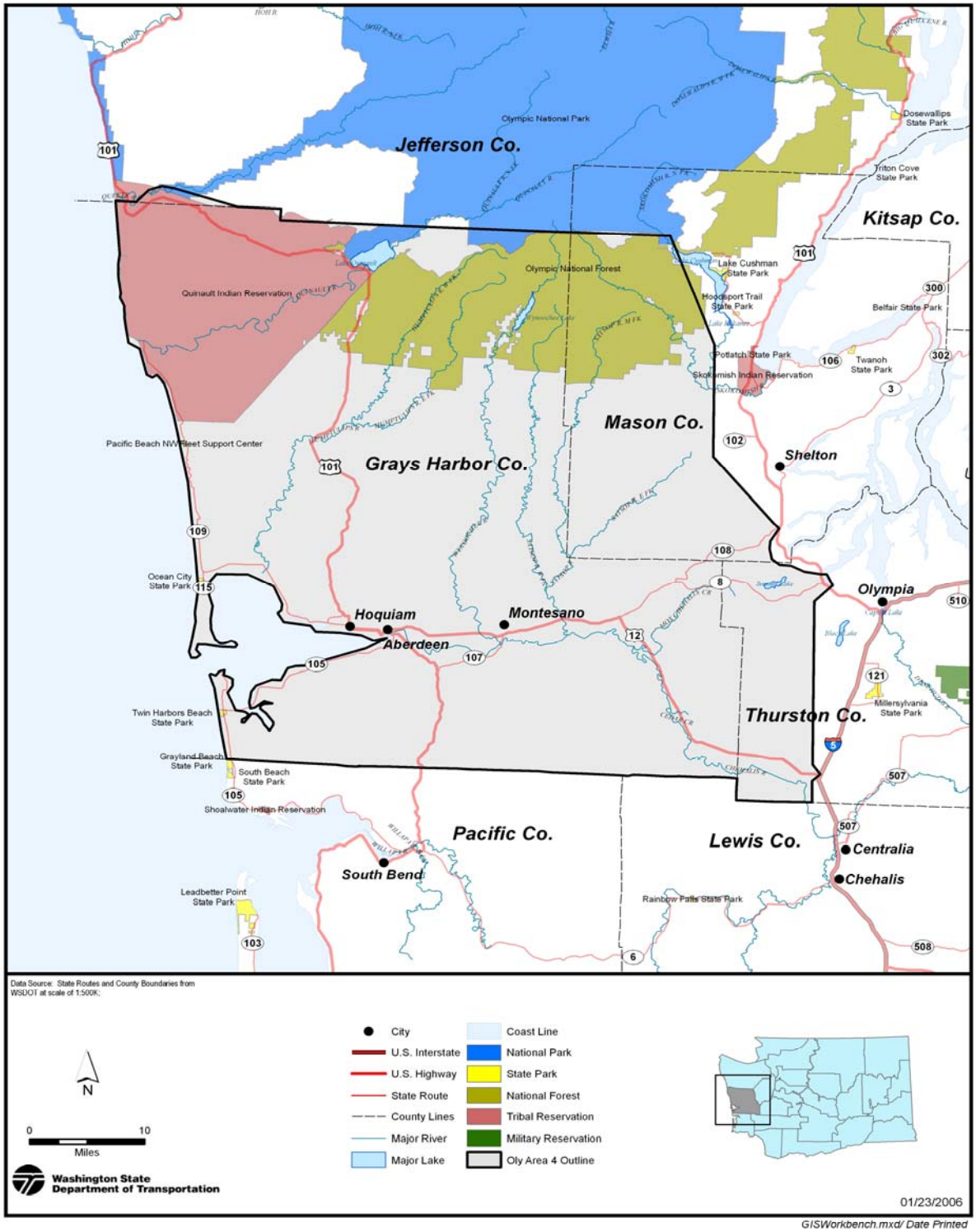


Olympic Region, Area 4 Map
Figure 1

Roadside Management Considerations

The primary objectives for maintenance of roadside vegetation are to provide for safe highway operation and to comply with legal regulations for control of noxious weeds and protection of the environment. Overall WSDOT maintenance policy and procedures are defined in Chapter 6 of the WSDOT Maintenance Manual (M51-01, March 2002) www.wsdot.wa.gov/fasc/EngineeringPublications/Manuals/MaintenanceManual.pdf

Visual Quality
It is also important to maintain appropriate visual standards in the appearance of the roadside. All maintenance activities should be conducted in a way that minimizes visual impacts such as wide spread "brown-out" from herbicides or shattered limbs from side trimming. Roadsides should look as natural as possible throughout the year. Appropriate visual quality for roadsides throughout the state is defined in the WSDOT Roadside Classification Plan (June 1996) www.wsdot.wa.gov/fasc/EngineeringPublications/Manuals/RCP.pdf

Operational Zones
WSDOT roadsides are divided into several zones for the purposes of assigning management objectives, maintenance needs, and thresholds for triggering vegetation maintenance actions. Noxious weed species designated for control by state and county law are controlled throughout all zones. Not all management zones occur along all state highways. In some cases the narrow width of the right-of-way or adjoining land-use, limits the operational zones to Zone 1 and/or a narrow Zone 2 only. Roadside vegetation management zones are illustrated in **Figure 2** below and defined as follows:

> **Zone 1** – A vegetation free gravel shoulder, where needed, is maintained as a one to three-foot wide strip to provide for key maintenance, operational, safety, and pavement and guardrail preservation needs. Zone 1 is typically maintained with an annual application of herbicides.
>
> **Zone 2** – The operational zone extends from the edge of Zone 1 or the pavement edge (if Zone 1 is not present) to a width necessary to provide for safe errant vehicular recovery, maintain sight distance at corners, intersections and for signs, and provide for other operational, safety, and environmental functions. Zone 2 is typically maintained by mowing a single pass adjacent to the pavement and through selective removal of unwanted trees and brush beyond the mowing strip
>
> **Zone 3** – In areas with sufficient right-of-way width, a buffer or transition zone extends from Zone 2 to the right-of-way line to provide a buffer or transitional area between the highway facility and adjacent land uses. This area is maintained selectively, and to the greatest degree possible as a self-sustaining plant community, to minimize erosion as well as the growth of weeds and undesirable trees and brush.

Roadside Maintenance Activities
All roadside maintenance activities are to be planned and conducted in a way that discourages or eliminates unwanted vegetation and promotes desirable vegetation. This is the basic premise of Integrated Vegetation Management. In every case it is essential that the results of maintenance activities are evaluated and adjusted as necessary to maximize efficiency and effectiveness. However, in some cases maintenance activities are conducted more consistently on an annual basis, such as maintenance of Zone 1 where required, and routine mowing where specified.

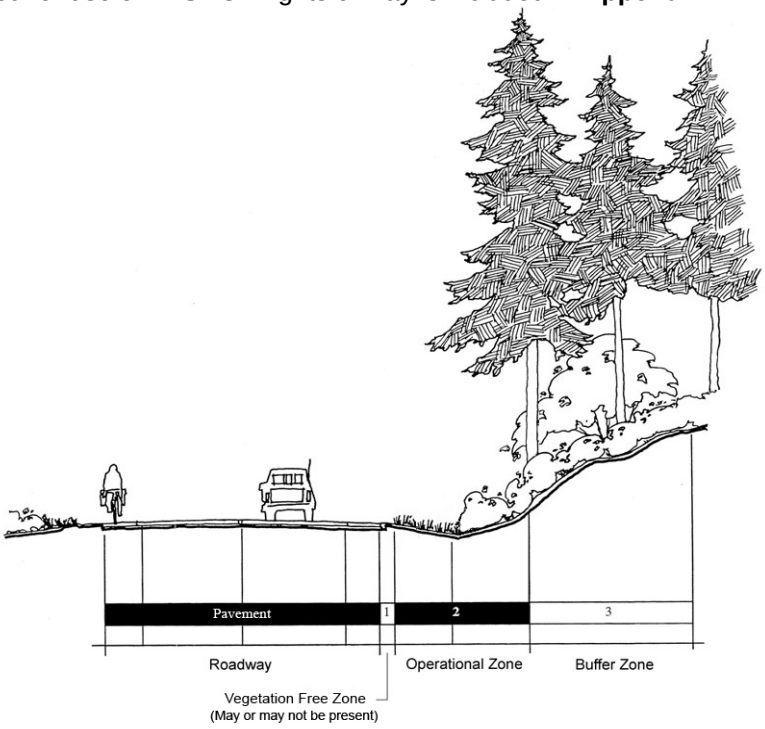
> **Routine Maintenance Activities** – When vegetation maintenance activities are intended to keep the area of roadside being treated in an annually controlled condition, they are considered routine. This is more critical for areas of vegetated roadside near the travel lanes, edge of pavement, and around guardrails. This plan provides prescriptions and gives locations for routine maintenance activities including maintenance of Zone 1 and annual mowing.

Integrated Vegetation Management Activities – Although all activities are to be planned and conducted in accordance with the principles of IVM, many vegetation maintenance activities are intended to target a specific type or types of unwanted plants. By carefully planning and carrying out these target specific activities it is possible over time to establish desirable vegetation, which will prevent the re-infestation of unwanted plants and reduce the need for maintenance over time. The process for determining and carrying out IVM actions is illustrated in **Figure 3** on the following page. This plan provides information, locations, and gives prescriptions for selective control of weeds and other unwanted vegetation and the promotion and establishment of desirable vegetation. Further information and guidance on the application of IVM is available in the document Integrated Vegetation Management for Roadsides (WSDOT, July 1997) www.wsdot.wa.gov/maintenance/pdf/IVM.pdf

Special Maintenance Areas – In some locations there are unique situations that require special consideration in determining appropriate vegetation maintenance actions. Examples of these are: environmentally sensitive areas, areas with special neighbor concerns, areas where a higher level of maintenance is expected such as gateway interchanges or formally landscaped areas, or along highways that cross tribal or federal lands. This plan provides information and guidance on the locations and unique requirements or restrictions on maintenance activities in all of these situations throughout the area.

Herbicide Use

WSDOT has conducted independent research on herbicide risk from toxicity and environmental fate, based specifically on agency application methods and use rates. Findings from this research have been used to establish an approved palette of herbicides and application limits for state highways. A complete summary of herbicides approved for use on WSDOT rights of way is included in **Appendix B**.

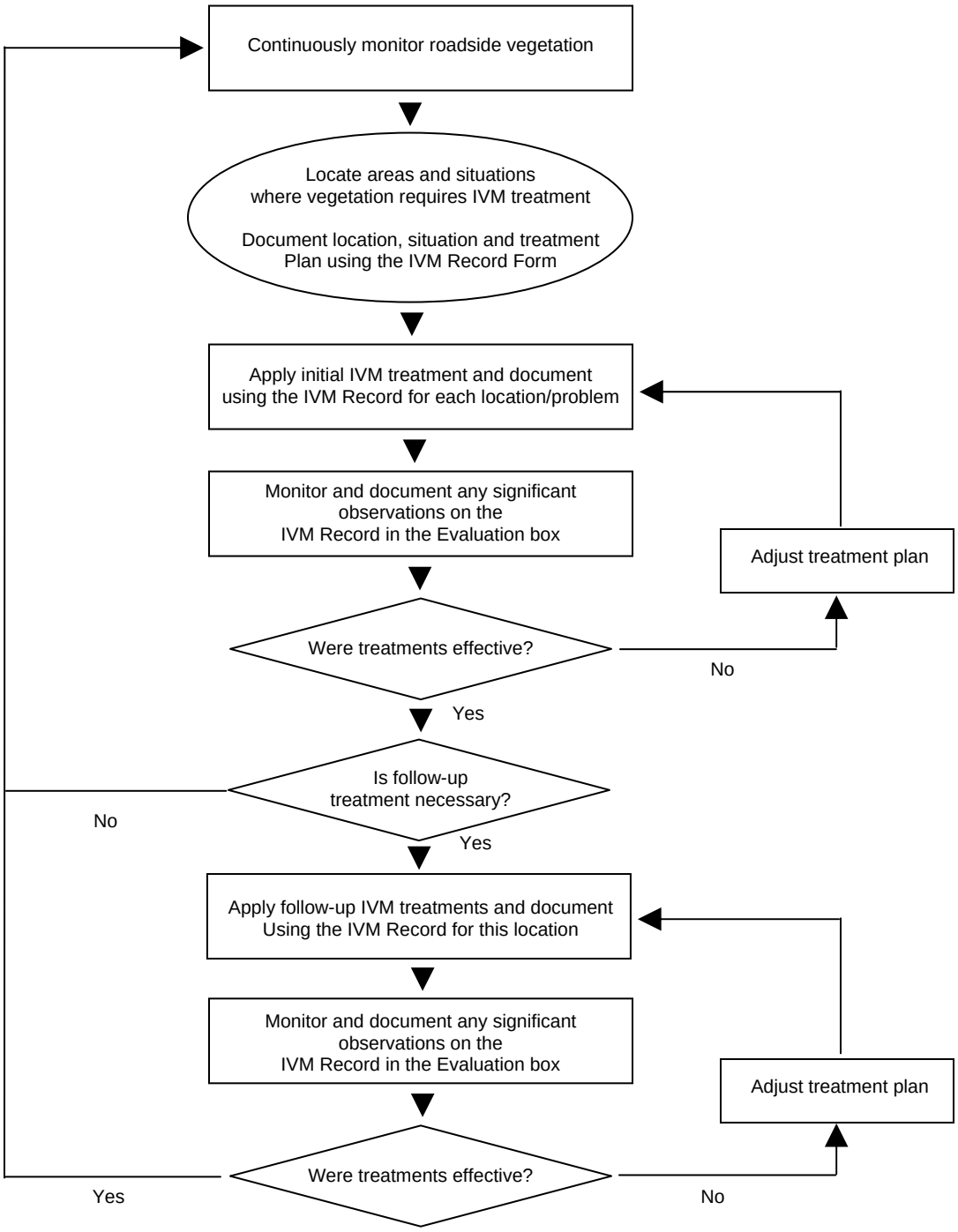


Vegetation Free Zone
Gravel Shoulder
Maintained in designated locations using mechanical and chemical methods for sight distance, to improve drainage, and to preserve pavement and roadside hardware.

Operational Zone
Low Vegetation
Maintained with mowing and IVM treatments for sight distance, safe errant vehicle recovery, and weed control.

Buffer Zone
Native/ Natural Vegetation
Where adequate right of way exists, maintained using IVM to encourage desirable vegetation in self-sustaining plant communities.

Typical Roadside Vegetation Management Zones
Figure 2



The IVM Decision-Making Process
Figure 3

Area IVM Goals

The purpose of this section is to identify the highest priority roadside vegetation management needs in Olympic Region, Area 4. Priorities are listed by specific activities and locations in relation to the three major groups for roadside vegetation maintenance performance: Control of Vegetative Obstructions, Noxious Weed Control, and Nuisance Weed Control. This section is intended to supplement the information in the following section, ***Olympic Region, Area 4 – Roadside Vegetation Management Plan*** which details the guidelines and methods for accomplishing the work of roadside vegetation management. The following lists essentially describe work plans for NW Region, Area 4 crews in 2009 and the following two to three years.

Control of Vegetative Obstructions
Since the work of this group of maintenance activities relates to the safety and operation of the highway, these items are considered first priority in terms of the overall roadside maintenance priority. Activities and locations of greatest need include:

WESTSIDE

- Mowing around intersections on SR 105, MP 37 to 30.45
- Mowing & brush cutting SR 109, MP 15.6 to MP 21.39 before the 4th of July
- Brush cutting SR 109 SB, MP 27.62 to 27.8 (Ocean view point)
- Mowing US 101, MP 120 to 125
- Brush cutting willows on SR 105, MP 45.2 to MP 42

EASTSIDE

- Brushing cutting US 12 MP 28 WB, Cedars and Alders
- Brushing cutting US 12 MP 41.5 EB, Cedars and Alders
- Arm Mowing US 101 From 76.6 to 67.2 both directions Alders, Scotch Broom, Blackberries
- Arm Mowing SR 107 from 7.4 to 0 both directions Alders, Scotch Broom, Blackberries, Vine Maples
- Arm Brusher SR 108 MP 2 to 11.5 both directions Alder, Scotch Broom, Blackberries
- Mowing one pass on US 12, MP 21 to 46.3, wider pattern at intersections where necessary – Porter Creek MP 26.8 EB, Dunlap MP 24.3 EB, Roseburg St. MP 42.9 EB, Denmark MP 43.5 EB
- Mowing one pass on SR 107, MP 0 to 6.8
- Mowing one pass on US 101, MP 67.2 to 76.7, wider pattern at intersection w/ Lund Rd. MP 73.9 SB
- Mowing one pass on SR 108, MP 2 to 11.5
- Tiger Claw on SR 008, MP 0 to 20.5 EB/WB shoulders and median
- Tiger Claw on US 12, MP 21 to 9 shoulders and median

Noxious Weed Control
Noxious weeds are those species legally designated by state and county regulations for required control by all property owners. Because laws provide for fines and/or control work and billing of property owners by county administration, work under this group is considered second priority after critical safety related locations have been addressed. Species and locations are negotiated with the county weed boards on an annual basis and for 2009 include:

WESTSIDE

- Orange Hawkweed SR 12 MP 5.1 to 5.6
- Orange Hawkweed SR 105 MP 36.2 to 36.4
- Yellow Hawkweed SR 109 MP 12 to 12.2
- Mousear Hawkweed SR 109 MP 29.8 to 30.1
- Himalayan Knotweed SR 12 MP 9.4
- Himalayan Knotweed SR 109 MP 40
- Himalayan Knotweed SR 105 MP 26.47
- Spotted Knapweed SR 105 MP 45.90
- Japanese Knotweed SR 12 MP 2 to 8 various locations
- Japanese Knotweed SR 101 Cosi Hill MP 80.2 to 78 various locations
- Japanese Knotweed SR 101 MP 89.2 to 100 various locations
- Japanese Knotweed SR 109 MP 3.3 to 40 various locations
- Japanese Knotweed SR 105 MP 25.7 to 47.4 various locations
- Gorse SR 105 MP 32.65 to 25.7
- Gorse SR 109 MP 24.25 and MP 29.44
- Japanese Knotweed SR 109 Spur MP 0-1.8
- Orange Hawkweed SR 101 MP 104.2 to 104.5
- Spotted Knapweed SR 101 MP 114.1 to 114.2
- Japanese Knotweed SR 101 MP 122
- Orange Hawkweed SR 101 MP 136.45 to 136.7
- Japanese Knotweed SR 101 MP 127.8
- Japanese Knotweed SR 101 MP 144

EASTSIDE

- Japanese Knotweed SR 8 MP 1.1 Cloquallum Bridge EB and WB
- Japanese Knotweed US 12 MP 20.3 EB 3rd St On Ramp
- Wild Chervil US 12 MP 41 WB
- Wild Chervil US 12 MP 18.8 WB (Pepsi Plant)
- Skeleton Weed US 12 MP 42.6 to 42.9 EB (Just west of Roseburg St.)
- Japanese Knotweed SR 107 MP 6 to 3 SB
- Japanese Knotweed SR 101 MP 76 SB (Across from Clarks)

Nuisance Vegetation Control

Nuisance vegetation control includes control/management of weed species that are recommended but not mandated, by state and county law. It also includes work such as mowing of grass and weeds in areas where a more neatly maintained appearance is desired such as in gateway interchanges or highways in urbanized areas. Because nuisance vegetation control is lower priority after safety related and legally mandated activities, the location and work actions listed below may be postponed depending on availability of resources.

WESTSIDE

- Alder and Scotch Broom SR 12 Aberdeen Bluff
- Scotch Broom and Blackberries SR 12 Devonshire Interchange
- Scotch Broom and Alder SR 101 MP 77 and SR 107 Junction

EASTSIDE

- Brown Brush Monitor US 12 MP 44.5 EB, Scotch Broom
- Brown Brush Monitor SR 008 MP 10.5 to 12.5 WB, Scotch Broom
- Brown Brush Monitor SR 008 MP 17.8 to 18.3 Shoulder & Median, Broom

1. ROUTINE MAINTENANCE ACTIVITIES

Roadside maintenance activities are considered routine when regular periodic treatment is required to keep vegetative growth from interfering with highway operational and maintenance objectives. Typical routine maintenance activities are maintenance of Zone 1 and certain types of mowing and trimming.

1.1. Routine Shoulder Maintenance (Zone 1)

WSDOT is currently re-evaluating its policy for maintenance of a vegetation-free Zone 1. Past policy and practice will be refined over the coming years in response to findings from study of long-term benefit/cost resulting from alternative treatments. For the 2006 growing season, vegetation at the edge of pavement will be managed as follows on roadsides in this maintenance area:

1.1.1. Guidelines

- A vegetation-free Zone 1 is maintained on the majority of shoulders throughout the area, except in designated locations as noted in this plan.
- Where designated a grass stand will be managed up to the edge of pavement and treated selectively with herbicides as needed for control of broadleaf weeds and seedling trees.
- In designated areas where grass is established up to the edge of pavement, a vegetation-free Zone 1 will still be maintained under guardrail in these areas. There are two exceptions where Zone 1 is not maintained under guardrail including US 101 through the City Hoquiam Drinking Water Protection Area and US 101 with the Olympic National Forest. In these locations vegetation under guardrail will be maintained as needed with mowing done by hand.
- Along designated sections of SR 8 and US 12 between junction with US 101 and Aberdeen, the area is experimenting with pavement edge maintenance using annual cultivation and repacking of the shoulder material.
- The width of Zone 1, where it is maintained, is 2' maximum width.

1.1.2 Methods

- A mixture of soil residual pre-emergent and non-selective post-emergent herbicides will be applied annually in the spring.
- For sections of US 101 and SR 109 across the Quinalt Reservation, an aquatic formulation of non-selective, post-emergent herbicides will be used with an aquatic surfactant.
- In areas where annual cultivation is being used, a pre-treatment with non-selective post-emergent herbicides may be used if significant amounts of vegetation are present.
- See **Appendix A, Routine Maintenance Prescriptions, Zone 1 Maintenance**

1.1.3 Locations

- Areas for maintenance of a vegetation-free Zone 1 and areas set aside for evaluation of alternative practices are shown in **Appendix C, Zone 1 Map**

1.2. Routine Mowing/Trimming (Zone 2)

1.2.1. Guidelines

- Routine annual mowing is conducted on all shoulders where a vegetation-free Zone 1 is not maintained.
- Annual mowing or trimming is also conducted as needed for locations on all highways to preserve site distance at curves, intersections and any other highway entry points.
- In all other areas mowing is only used occasionally as part of IVM treatments for weed and brush control as described below in **Section 2**.

1.2.2. Methods

- In areas where vegetation-free Zone 1 is not maintained, annual mowing will consist of a single pass, 4' to 6' in width, depending on the equipment used.
- See **Appendix A, Routine Maintenance Prescriptions, Zone 2 Maintenance**

1.2.3. Locations

- Locations routinely mowed for site distance and sign visibility exist throughout the area and locations will be determined as needed in the field.

1.3. Hazard Tree Removal

1.3.1. Guidelines

- Hazard tree removal is considered a routine maintenance activity because maintenance is constantly on the look out for any trees that pose an imminent threat to the highway or traffic. Whenever hazard trees are identified they are routinely removed as soon as possible.
- Hazard trees may be dead, leaning, or structurally unsound. Best horticultural judgment will be used in evaluating trees that appear diseased or structurally unsound or are believed to pose a long-term threat to determine the best course of action.
- Another consideration in removal of trees is the contribution to shading in areas prone to frost and ice formation on the highway surface. When such areas are identified, the surrounding canopy may be thinned through selective removal of large trees on the right of way.

1.3.2. Methods

- Hazard trees are removed in such a manner to minimize damage and impact to the highway structure and other healthy trees and under-story vegetation.

2. INTEGRATED VEGETATION MANAGEMENT ACTIVITIES

For all vegetation management needs not addressed through routine maintenance as described above, activities are planned and carried out using the principles of Integrated Vegetation Management (IVM) and the decision making process diagrammed on Page 5 in **Figure 3**. IVM is a coordinated decision making process that uses the most appropriate vegetation management methods and strategy, along with a monitoring and evaluation system, to achieve long term roadside maintenance goals and objectives in an environmentally and economically sound manner. The goal in utilizing the IVM approach is the effective control of unwanted vegetation and the establishment of stable, low maintenance native or naturalized plant communities on the roadside that are compatible with:

- Highway maintenance and safety objectives
- Preservation of environmental quality
- Weed control requirements
- The concern's of WSDOT's customers and neighbors.

Long term, the use of the IVM approach can reduce the intensity and cost of maintenance, as well as minimizing the need to use herbicides.

2.1. Integrated Vegetation Management Planning and Tracking Database

2.1.1. Guidelines

- An Integrated Vegetation Management Records database is available for use. This database is accessed through the same WSDOT network application as the Pesticide Application Records database.
- Any activities focused on treatment of a specific location and species infestation, or focused on treatment of any types of unwanted vegetation throughout the area will be documented with an initial IVM record outlining the long-term treatment plan. These same records will be updated over time whenever planned treatments are carried out, or when observations are made as to the success or failure of past treatments.
- Treatment records may be printed out and inserted into **Appendix F**.

2.2. Noxious Weed Control

2.2.1. Guidelines

- Noxious weed control is a high priority for WSDOT because of state law requiring control of designated species. Transportation rights of way are high priority locations for control of noxious weed species within the state because they cross and link so many adjacent properties and land uses and may act as conduits for the spread of weeds.
- Whenever possible, designated noxious weed species and infestations locations will be documented and treated following plans as defined by IVM record forms in the database.
- Washington State Law classifies noxious weeds in three classes: A, B, and C. All Class A species are required control wherever they occur statewide. The law allows for individual county weed boards to designate individual Class B and C weeds for control within the counties depending on how widespread and potentially harmful they are at the local level.
- For the purposes of this plan, "noxious weeds" are defined as species within any class designated for control within the counties.

All Class B or C weeds not designated by the counties for control are defined and managed as "nuisance weeds".

- For Olympic Region, Area 4 the following designated weeds are known to exist on state highway rights of way in Grays Harbor and western portions of Mason and Thurston Counties:

Class A
Class A noxious weeds are non-native species with a limited distribution in the state. No Class A weeds are known to exist on WSDOT rights of way in this area.

Class B
Class B weeds are more widespread than Class A, with control mandated by law only if infestations are generally limited and the species are designated within the individual counties by the County Noxious Weed Control Boards. The following species are know to be present on highway rights of way in the area and are designated for control:

Common Name/Botanical Name
Ragwort tansy/Senecio jacobaea
Knapweed sp./Centaurea sp.
Purple loosestrife/Lythrum salicaria
Wild chervil/Anthriscus sylvestris
Orange hawkweed/Hieracium aurantiacum
Gorse/Ulex europaeus

Class C
Class C noxious weeds are widely established throughout Washington or may impact the agricultural industry. At this time no Class C weeds are required for control in any of the counties where rights of ways are maintained by Olympic Region, Area 4.

2.2.2. Methods

- Because noxious weed species are often difficult to control, herbicides treatments are often the primary, initial means of control.
- If infestations are limited to a few plants, hand pulling is also effective when the entire root system is also removed. Maintenance employees are encouraged to be aware of and look for new noxious weed occurrences, and to stop and pull these plants whenever possible.
- In conjunction with weed control treatments, a variety of other measures may be taken to promote natural vegetative competition through seeding, planting, and soil enhancement. The IVM Record and database are essential to the execution and success of these control measures.
- For recommended treatments specific to noxious weed species, see **Appendix A, IVM Prescriptions, Noxious Weed Control**

2.2.3. Locations

- **Appendix D, Noxious Weed Location Map** shows locations where reoccurring infestations of noxious species are known to exist in Olympic Region, Area 4.

2.3. Nuisance Weed Control

2.3.1. Guidelines

- For the purposes of this plan, nuisance weed species are defined as species listed as Class B and C weeds on the state noxious weed lists, but not required for control within individual counties.
- Nuisance weed control, while not required by state law, provides many positive benefits to the overall condition of the roadside, enhances ecological function by maintaining and enhancing native plant communities, reduces the potential for continuing spread of weed infestations, improves neighbor relations, and enhances visual quality.
- Nuisance weed species will be controlled when time and budget allows.
- Priority will be given to locations with the highest chance for success including relatively new infestations and where there is potential for infestations to spread to un-infested areas of the right of way or to un-infested neighboring properties.
- Species designated as nuisance weeds in Olympic Region, Area 4 include:

Common Name/Botanical Name
Butterfly bush/Buddleja davidii
Poison hemlock/Conium maculatum
St. Johnswort/Hypericum perforatum
Common tansy/Tanacetum vulgare
Bull thistle/Cirsium vulgare
Canada thistle/Cirsium arvense
Scotch broom/Cytisus scoparius
Wild carrot/Daucus carota
Common Mullein/Verbascum thapsus
Himalayan blackberry/Rubus discolor

2.3.2. Methods

- Control measures for nuisance weed are dependent on the type of plant.
- Woody species such as Scotch broom and Himalayan blackberry are most effectively treated with a combination of cutting, herbicide treatments and encouragement of native vegetation.
- Perennial species such as Canada thistle are most effective controlled by succeeding years of properly timed herbicide applications.
- Annual or biennial species such as bull thistle and common tansy may also be effectively controlled with herbicide applications when plants are in the rosette stage in spring, or by hand pulling prior to seed set.
- In some case biological controls are the best means for managing widespread nuisance weed species.
- See **Appendix A, IVM Prescriptions, Nuisance Weed Control**.

2.3.3. Locations

- Focus areas for priority nuisance weed control activities are listed in the IVM Goals section on Page 9.

2.4. Tree and Brush Control

2.4.1. Guidelines

- Trees and brush are controlled for safety reasons including preservation of sight distance at curves and intersections, and for visibility of signs, and preventing trees with large trunk diameter from growing too close to traffic lanes.
- Native large shrub and small tree species should be allowed to grow and mature in Zone 2 and selectively trimmed if they begin to encroach on site distance or other traffic operational requirements.
- Large coniferous or hardwood deciduous tree species such as Douglas fir, bigleaf maple, alder, or cottonwood left to grow in Zone 2 and in some cases parts of Zone 3, can reach substantial size over a relatively short period of time and should be removed when young.
- Any tree with a trunk diameter of 4" or greater is considered a hazard for errant vehicles in Zone 2 and should be removed. This zone is also referred to as the Design Clear Zone and is typically maintained to a width of 30' from the traffic lane edge. Actual minimum widths are determined by roadway alignment, traffic speed and volume, and cross-section of the roadside, as specified in the WSDOT Design Manual, Chapter 700.04. www.wsdot.wa.gov/fasc/EngineeringPublications/Manuals/DesignManual.pdf

2.4.2. Methods

- Removal of undesirable tree and brush species is typically accomplished by hand cutting, hand pulling, properly timed selective mowing, properly timed herbicide applications, or combinations thereof.
- In some locations it is most effective to mow back the majority of the existing vegetation and then selectively treat undesirable re-growth with herbicides in succeeding years, allowing desirable vegetation to grow up around and form a competitive cover.
- In some cases when tree and brush species are cut by hand, the debris can be fed through a chipper and placed back on the roadside in the form of mulch.
- Timing of these activities has a significant effect on how the vegetation grows back. Herbicide applications made by hand, directly to the cut surfaces of undesirable plants may be used to reduce or eliminate grow back.
- Chemical control methods will not be used on conifers greater than 2 feet in height.
- Chemical control methods will not be used on deciduous plants until after the first of September, except for as stump treatments in conjunction with mechanical cutting to eliminate grow-back.
- Whenever possible, safe and practical, seedling trees will be dug or pulled by hand and transplanted to areas where there growth will be beneficial and appropriate. Agreements may be signed to allow private citizens to collect seedlings for use as transplants.
- See **Appendix A, IVM Prescriptions, Tree and Brush Control**.

3. SPECIAL MAINTENANCE AREAS

Special Maintenance Areas are any locations with unique maintenance requirements or special considerations for roadside management. These areas may include interchanges, community entrances or enhancement areas, areas maintained by cities, bicycle paths, storm water retention ponds, state park land, wellheads, environmentally sensitive areas, school zones and roadsides adjacent to individual properties with current or annual no-spray agreements.

3.1. Interchanges/Intersections

3.1.1. Guidelines

- Interchange areas are sometimes developed to a greater level than general roadside areas to include storm water management facilities, pedestrian areas, and permanent vegetation designed for screening, and visual enhancements for community entrances.

3.1.2. Locations

- Interchanges and intersections with unique maintenance considerations are listed in **Appendix E**, along with notes describing practices for each location.

3.2. City Maintenance Areas

3.2.1. Guidelines

- In most cases where non-limited access highways exist within city limits, the roadside (all area outside the highway pavement and drainage systems) are maintained by the local city government.

3.2.2. Locations

- Areas where roadsides are maintenance by cities are listed by route and begin and end milepost in **Appendix E**.

3.3. Herbicide Sensitive Areas

3.3.1. Guidelines

- In some situations herbicide use is limited or restricted because of legal requirements, neighbor concerns, or WSDOT imposed environmental safety precautions.
- In these locations, vegetation must be managed without the use of herbicides or with only a limited palette of herbicide types.

3.3.2. Locations

- Individual areas and limitations or restrictions that apply are listed in **Appendix E**.

3.4. Adopt-a-Highway and Neighbor Maintained Agreements

3.4.1. Guidelines

- In some locations WSDOT has signed agreements with private citizens or neighboring businesses for maintenance of roadside vegetation.

3.4.2. Locations

- Areas with existing agreements for others to maintain a portion of the roadside are listed in **Appendix E**, along with notes describing arrangements for each location.

3.5. Storm Water Management Facilities

3.5.1. Guidelines

- Storm water management facilities include bio-filtration swales, retention ponds and infiltration ponds.
- Storm water management facilities are managed for noxious and nuisance weeds, and hazard trees following the same guidelines mentioned in previous sections. The primary objectives with regard vegetation management within these facilities are maintenance the functionality in terms of the designed volume of retention and water flow, and the maintenance of the surrounding fence
- Trees and brush should be cleared along both sides of the perimeter fencing for a width of approximately 8 feet as needed.
- Inlets and outfalls should be kept clear of vegetation and debris.

3.5.2. Locations

- Stormwater management facilities are listed by route and milepost in **Appendix E**.

3.6. Wetland Mitigation Sites

3.6.1. Guidelines

- Wetland mitigation sites are carefully monitored through WSDOT's Environmental Services Office for up to 10 years following their creation to ensure compliance with environmental regulations.
- In most cases vegetation in these sites is planted and established through the construction process so the maintenance actions are not required unless noxious weeds or hazardous trees become an issue.

3.6.2. Locations

- All wetland mitigation sites within Olympic Region, Area 4 are listed by the nearest route and milepost in **Appendix E**.

3.7. IVM Treatment Sites

3.7.1. Guidelines

- As discussed in **Section 2.1**, selected sites are designated for planning, carrying out and monitoring multi-year IVM treatments for control of weeds or other unwanted vegetation.
- IVM treatment sites are documented with an initial record in the IVM Treatment Database, to identify the problem to be addressed, location(s), management goals, and integrated treatment plan.
- Records are updated each time a treatment is made, results observed, or when the treatment plan is modified based on observations.

3.7.2. Locations

- All designated IVM treatment sites within Olympic Region, Area 4 are listed by the route and milepost in **Appendix E**. This list is updated annually as new sites may be added and successfully treated sites removed.

Zone 1 Maintenance - Bareground Treatment

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Gravel shoulder	Gravel shoulder	Gravel shoulder	Gravel shoulder
MANAGEMENT GOALS:	Vegetation free	Vegetation free	Vegetation free	Vegetation free
METHOD:	Annual herbicide application	Annual herbicide application	Annual herbicide application	Annual herbicide application
EQUIPMENT:	Spray truck w/ banned width nozzles	Spray truck w/ banned width nozzles	Spray truck w/ banned width nozzles	Spray truck w/ banned width nozzles
MATERIALS:	Payload 8 oz./acre + Oust 3 oz./acre	Milestone VM 7 oz./acre + Round Up Pro 64 oz./acre	Round Up Pro 64-128 oz./acre	Landmark 4.5-7 oz./acre + Razor Pro 64 oz./acre
TIMING:	Early Spring or Fall	Early Spring	Early to mid June	Early Spring
IVM FOLLOW-UP:	Evaluate control	Evaluate control	Evaluate control	Evaluate control
REMARKS:	Typically applied in a 2 to 3 ft. band.			

Zone 1 Maintenance - Bareground Treatment

	OPTION 1			
TREATMENT TYPE:	Around senstive locations			
MANAGEMENT GOALS:	Vegetation free			
METHOD:	Annual herbicide application			
EQUIPMENT:	Spray truck w/ banned width nozzles			
MATERIALS:	Aquanet at 64 oz./acre + LI700 at 32 to 64 oz./100 gal.			
TIMING:	Early Spring or Fall			
IVM FOLLOW-UP:	Evaluate control			
REMARKS:	Typically applied in a 2 to 3 ft. band.			

Zone 2 Maintenance - Tree and Brush

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Confer control	Deciduous tree and brush	Deciduous tree and brush	Deciduous tree and brush
MANAGEMENT GOALS:	Control vegetation obstruction	Control vegetation obstruction	Control vegetation obstruction	Control vegetation obstruction
METHOD:	Herbicide treatment	Herbicide treatment	Herbicide treatment	Stump Treatment
EQUIPMENT:	Spray truck w/ banned width nozzles	Spray truck w/ banned width nozzles	Spray truck w/ banned width nozzles	Dobber or Spray bottle
MATERIALS:	Garlon 3A 128 oz. and Escort 1 oz.	Milestone VM 5-7 oz. plus Garlon 3A 64 oz.	Krenite S	Garlon 3A 50/50 with water or suf. Garlon 4 50/50 with water or suf.
TIMING:	Late summer, early fall	Late summer, early fall	Late summer before leaf turn	Anytime
IVM FOLLOW-UP:	Evaluate control	Evaluate control	Evaluate control	Evaluate control
REMARKS:	Avoid brown out by spraying late in the season and spray only to appropriate height.			

Noxious Weed Control - Tansy Ragwort

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Chemical application	Chemical application	Manual	Bio-Control
ACTION THRESHOLD:	As soon as plants appear.	As soon as plants appear.	As soon as plants appear.	
MANAGEMENT GOALS:	Eradication and control if required by county.	Eradication and control if required by county.	Eradication and control if required by county.	Eradication and control if required by county.
METHOD:	Spot treatment w/herbicide	Spot treatment w/herbicide	Hand removal. May include cut stem.	
EQUIPMENT:	Tank sprayer where possible, backpack sprayer where necessary.	Tank sprayer where possible, backpack sprayer where necessary.		
MATERIALS:	Escort 1/2 to 1 oz./acre	Milestone VM 5 to 7 oz./acre	None required. Round -up in spray bottle for cut stem.	Flea beetle/Cinnabar Moth
TIMING:	Spray by May	Spray by June	Pull by June	
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize to reduce weed competition.	Reapply as necessary. Seed and fertilize to reduce weed competition.	Repeat as necessary. Seed and fertilize to reduce weed competition.	
REMARKS:				

Noxious Weed Control - Knapweed sp.

	OPTION 1	OPTION 2	OPTION 3	
TREATMENT TYPE:	Chemical application	Chemical application	Manual	
ACTION THRESHOLD:	As soon as plants appear.	As soon as plants appear.		
MANAGEMENT GOALS:	Eradication and control if required by your county.	Eradication and control if required by your county.	Eradication and control if required by your county.	
METHOD:	Spot treatment w/ herbicide	Spot treatment w/ herbicide is most affective.	Hand removal. Roots must also be removed. Remove plant from site.	
EQUIPMENT:	Tank sprayer where possible, backpack sprayer where necessary	Tank sprayer where possible, backpack sprayer where necessary.	Labor, transportation	
MATERIALS:	Milestone 5 to 7 oz./acre	Transline .66 to 1.33 pints/acre	none required	
TIMING:	Early budding stages	Early budding stages	Early budding stages	
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize to reduce weed competition.	Reapply as necessary. Seed and fertilize to reduce weed competition.	Repeat as necessary. Seed and fertilize to reduce weed competition.	
REMARKS:				

Noxious Weed Control - Purple Loosestrife

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Chemical application	Chemical application	Chemical application	Biological Agents
ACTION THRESHOLD:	whenever present	whenever present	whenever present	whenever present
MANAGEMENT GOALS:	Suppression and eradication of listed noxious weeds	Suppression and eradication of listed noxious weeds	Suppression and eradication of listed noxious weeds	Suppression and eradication of listed noxious weeds
METHOD:	Spot treatment w/ herbicide	Spot treatment w/ herbicide	Spot treatment w/ herbicide	
EQUIPMENT:	Backpack sprayer or pump can sprayer, pickup.	Backpack sprayer or pump can sprayer, pickup.	Backpack sprayer or pump can sprayer, pickup.	Pickup
MATERIALS:	Rodeo at 1-2 ozl/gallon, mixed with a non-ionic surfactant.	Auquaneat 4 pints/acre	Garlon 3A 6 to 8 quarts/acre	Galerucella Pusilla
TIMING:	July, August and September when mature plant appear.	July, August and September when mature plant appear.	July, August and September when mature plant appear.	During active growth
IVM FOLLOW-UP:	Monitor sites for re-growth. Reapply spot treatment as necessary.	Monitor sites for re-growth. Reapply spot treatment as necessary.	Monitor sites for re-growth. Reapply spot treatment as necessary.	Map and monitor release sites. Evaluate treatment. Establish No spray and No mow zones.
REMARKS:	Apply during actively growing at or beyond bloom stage of growth. Best results are achieved when applications are made during summer or fall months. Fall treatment must be applied before a killing frost.			

Noxious Weed Control - Wild Chervil

	OPTION 1	OPTION 2		
TREATMENT TYPE:	Chemical application	Chemical application		
ACTION THRESHOLD:	As soon as plants appear.	As soon as plants appear.		
MANAGEMENT GOALS:	Eradication and control of noxious weeds.	Eradication and control of noxious weeds.		
METHOD:	Spot treatment w/ herbicide.	Spot treatment w/ herbicide.		
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer	Truck mounted sprayer where possible, backpack sprayer		
MATERIALS:	2 oz./acre Escort and 7oz./acre Milestone VM	1-3 oz./acre Telar DF		
TIMING:	Prebloom April/May	Apply early post emergence to actively growing plants		
IVM FOLLOW-UP:	Repeat as necessary. Seed and fertilize to reduce weed competition.	Repeat as necessary		
REMARKS:	Reportedly, it tolerates 24-D			

Noxious Weed Control - Hawkweed sp.

	OPTION 1	OPTION 2		
TREATMENT TYPE:	Chemical application	Chemical application		
ACTION THRESHOLD:	Apply while actively growing	Apply while actively growing		
MANAGEMENT GOALS:	Eradication of listed noxious weeds.	Eradication of listed noxious weeds.		
METHOD:	Power sprayer	Power sprayer		
EQUIPMENT:	Spray tank	Spray tank		
MATERIALS:	Milestone VM 4 to 6 oz./acre	Transline .66 to 1 pint/acre		
TIMING:	Bolting stage	Bolting stage		
IVM FOLLOW-UP:	Multiple treatment as needed	Multiple treatment as needed		
REMARKS:				

Noxious Weed Control - Gorse

	OPTION 1	OPTION 2	OPTION 3	
TREATMENT TYPE:	Chemical application	Chemical application	Chemical application	
ACTION THRESHOLD:	As soon as plant appears	As soon as plant appears	As soon as plant appears	
MANAGEMENT GOALS:	Eradication and control of listed noxious weeds.	Eradication and control of listed noxious weeds.	Eradication and control of listed noxious weeds.	
METHOD:	Spot treatment w/ herbicide.	Spot treatment w/ herbicide.	Spot treatment w/ herbicide.	
EQUIPMENT:	Tank sprayer where possible, backpack spray where necessary.	Tank sprayer where possible, backpack spray where necessary.	Tank sprayer where possible, backpack spray where necessary.	
MATERIALS:	1/2 to 1 oz. Escort XP with Phase	1 to 8 quartz Garlon 4 per acre	Razor Pro 2 to10 quartz per acre	
TIMING:	Spray by June	While actively growing	While actively growing	
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize to reduce weeds competition.	Reapply as necessary	Reapply as necessary	
REMARKS:	Be observant of temperature when apply Garlon 4			

Nuisance Weed Control - Butterfly Bush

	OPTION 1	OPTION 2	OPTION 3	
TREATMENT TYPE:	Chemical application	Chemical application	Chemical application	
ACTION THRESHOLD:	Whenever present	Whenever present	Whenever present	
MANAGEMENT GOALS:	Eradication	Eradication	Eradication	
METHOD:	Cut Stump	Broadcast spray	Broadcast spray	
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Power Spray	Power Spray	
MATERIALS:	Garlon 4 50/50 with MOST	Garlon 3A 64 oz./acre	Crossbow 64 oz./acre	
TIMING:	Late season	Early season to Mid season	Early season to Mid season	
IVM FOLLOW-UP:	Re-cut/treat as necessary.	Reapply if needed	Reapply if needed	
REMARKS:				

Nuisance Weed Control - Poison Hemlock

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Chemical application	Hand removal	Chemical application	Chemical application
ACTION THRESHOLD:	When plants appear	When plants appear	When plants appear	When plants appear
MANAGEMENT GOALS:	Eradication and control of listed noxious weeds.	Eradication and control of listed noxious weeds.	Eradication and control of listed noxious weeds.	Eradication and control of listed noxious weeds.
METHOD:	Spot treatment w/ herbicide	Hand removal. Remove plant from site	Spot treatment w/ herbicide	Spot treatment w/ herbicide
EQUIPMENT:	Backpack sprayer, pickup etc.	Labor, transportation	Backpack sprayer, pickup etc.	Backpack sprayer, pickup etc.
MATERIALS:	Telar 1 to 3 oz.	None required	Excort 1 to 2 oz./Phase	1 -2 percent per acre Glyphosate
TIMING:	Spray by April	Pull by April	Apply to actively growing plan	Treat at bud to full bloom stage of growth
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize to reduce weed competition.	Repeat as necessary. Seed and fertilize to reduce weed competition.	Reapply as necessary	Reapply as necessary
REMARKS:	Use a nonionic surfactant or silicone surfactant			

Nuisance Weed Control - St. Johnswort

	OPTION 1	OPTION 2	OPTION 3	
TREATMENT TYPE:	Chemical application	Chemical application		
ACTION THRESHOLD:	When resources are available.	When resources are available.		
MANAGEMENT GOALS:	Minimize populations and prevent further spread of nuisance weeds.	Minimize populations and prevent further spread of nuisance weeds.		
METHOD:	Foliar treatment, mechanical.	Foliar treatment, mechanical.		
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary, mower.	Truck mounted sprayer where possible, backpack sprayer where necessary, mower.		
MATERIALS:	Milestone VM 5 to 7 oz./acres	1-2 oz./acre Escort plus Phase		
TIMING:	Apply after weeds emerge	Apply after weeds emerge		
IVM FOLLOW-UP:	Reapply as necessary	Reapply as necessary		
REMARKS:	Repeat application as needed			

Nuisance Weed Control - Common Tansy

	OPTION 1	OPTION 2	OPTION 3	
TREATMENT TYPE:	Whenever present	Whenever present	Whenever present	
ACTION THRESHOLD:	Whenever present	Whenever present	Whenever present	
MANAGEMENT GOALS:	Eradication	Eradication	Eradication	
METHOD:	Foliar treatment. Cut stem treatment.	Foliar treatment	Foliar treatment	
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.	
MATERIALS:	Telar 1 to 3 oz./acre	Escort 1 to 2 oz./acre	Milestone VM 3 to 5 oz./acre	
TIMING:	Anytime	Apply to actively growing vegetation in the Spring	Apply to actively growing vegetation in the Spring	
IVM FOLLOW-UP:	Re-cut/treat as necessary.	Retreat as necessary	Retreat as necessary	
REMARKS:				

Nuisance Weed Control - Bull Thistle

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Chemical application	Chemical application	Chemical application	Bio-Control
ACTION THRESHOLD:	Wherever present	Wherever present	Wherever present	
MANAGEMENT GOALS:	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.
METHOD:	Foliar treatment w/ herbicide	Foliar treatment w/ herbicide	Foliar treatment w/ herbicide	Bio-Control
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.	
MATERIALS:	Transline at 2/3 - 1 1/3 pint/acre	Milestone VM 3 to 5 oz. per acre	Telar XP 1-3 oz./acre	Urophora Stylata
TIMING:	Apply from rosette to bud stage to actively growing thistle	Apply to young actively growing weeds.	Apply to young actively growing weeds.	Early growing stage
IVM FOLLOW-UP:	Repeat annually as necessary	Repeat annually as necessary	Repeat annually as necessary	Reapply as necessary
REMARKS:				

Nuisance Weed Control - Canada Thistle

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Chemical application	Chemical application	Chemical application	Bio-Control
ACTION THRESHOLD:	Wherever present	Wherever present	Wherever present	Wherever present
MANAGEMENT GOALS:	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.
METHOD:	Foliar treatment w/ herbicide	Foliar treatment w/ herbicide	Foliar treatment w/ herbicide	
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.	
MATERIALS:	Transline at 2/3 - 1 1/3 pint/acre	Milestone VM 5-7 oz./acre	Telar XP 1-3 oz./acre	Rhinocyllus Conicus
TIMING:	Apply from rosette to bud stage to actively growing thistle	Pre bud stage	Apply to the bud at bloom stage	Early growing season
IVM FOLLOW-UP:	Repeat annually as necessary	Apply before first frost	Apply before first frost	Redeploy as needed
REMARKS:	For most effective control, apply as a broadcast treatment to the entire infested area.			

Nuisance Weed Control - Wild Carrot

	OPTION 1	OPTION 2		
TREATMENT TYPE:	Chemical application	Chemical application		
ACTION THRESHOLD:	Wherever present	Wherever present		
MANAGEMENT GOALS:	Eradication and control of selected nuisance weeds and brush.	Eradication and control of selected nuisance weeds and brush.		
METHOD:	Foliar treatment w/ herbicide	Foliar treatment w/ herbicide		
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Truck mounted sprayer where possible, backpack sprayer where necessary.		
MATERIALS:	Telar 1oz./acre	Crossbow 4 quarts/acre		
TIMING:	Apply from rosette to bud stage to actively growing thistle	Apply from rosette to bud stage to actively growing thistle		
IVM FOLLOW-UP:	Repeat annually as necessary	Repeat annually as necessary		
REMARKS:				

Nuisance Weed Control - Common Mullein

	OPTION 1			
TREATMENT TYPE:	Chemical application			
ACTION THRESHOLD:	When resources are available.			
MANAGEMENT GOALS:	Minimize population and prevent further spread of nuisance weeds.			
METHOD:	Foliar treatment, mechanical			
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary, mower.			
MATERIALS:	7oz./acre Milestone VM			
TIMING:	Spring			
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize or plant to restore native plant community.			
REMARKS:				

Nuisance Weed Control - Himalayan Blackberry

	OPTION 1	OPTION 2		
TREATMENT TYPE:	Chemical application	Mechanical application		
ACTION THRESHOLD:	Whenever present (dependant on resources)	When resources are available.		
MANAGEMENT GOALS:	Control and eradicate if county requires.	Minimize populations and prevent further spread of weed.		
METHOD:	Foliar treatment w/ herbicide	Mechanical control with follow-up cut stump treatment.		
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Mower or hand labor, backpack sprayer or spray bottle where necessary.		
MATERIALS:	Krenite 1.5-6 gallons/acre	Crossbow 1.25-1.5 gallons/acre		
TIMING:	In the Fall, after berries drop.	After mowing, in the fall.		
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize or plant to restore native plant community	Re-cut/treat as necessary. Seed and fertilize or plant to restore native plant community.		
REMARKS:				

Nuisance Weed Control - Scotch broom

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
TREATMENT TYPE:	Chemical application	Manual application	Mechanical application	Bio-Control
ACTION THRESHOLD:	Whever new infestations occur (dependant on available resources)	Wherever present (dependant on available resources)	When resources are available.	When ever present
MANAGEMENT GOALS:	Minimize populations and prevent further spread of weed.	Minimize populations and prevent further spread of weeds.	Minimize populations and prevent further spread of nuisance weeds.	Minimize spread
METHOD:	Foliar treatment w/herbicide.	Hand pull	Mechanical control with follow-up cut stump treatment.	Bio-Control
EQUIPMENT:	Truck mounted sprayer where possible, backpack sprayer where necessary.	Weed wrench option, brown brush monitor	Mower, backpack sprayer where necessary.	Truck
MATERIALS:	Garlon 3A at 2 quartz with Escort 2 oz. with Phase per acre	Garlon 4 mix 2 to 1 with crop oil	Garlon 3A at 1 to 1 with water or surfactant	Exapionfuscirostre
TIMING:	Apply during actively growing season	Anytime	After mowing	release when actively growing.
IVM FOLLOW-UP:	Reapply as necessary. Seed and fertilize or plant to restore native plant community.	Reapply as necessary. Seed and fertilize or plant to restore native plant community.	Re-cut/treat as necessary. Seed and fertilize or plant to restore native plant community.	Evaluate, redeploy if necessary
REMARKS:				

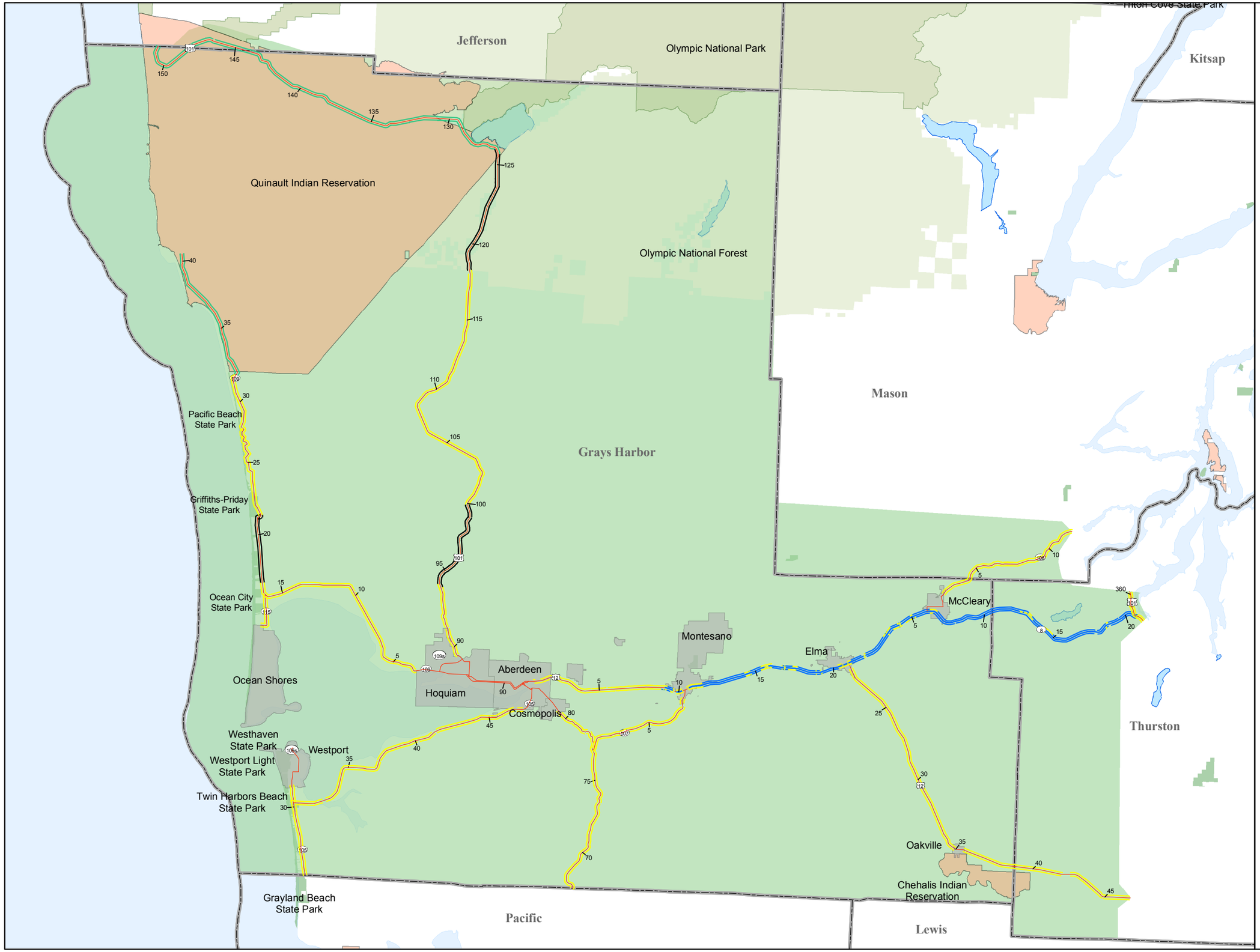
Herbicides Approved for Use on WSDOT Rights of Way

When making herbicide applications:
1. Always read and follow product labels
2. Always use personal protective equipment when mixing, loading, and applying

Chemical Name	***Product Name(s)***	***Where Used***	***How/Why Used***	***Notes/Recommendations***	***Restrictions***	***Cautions***
2,4-D	Weedar 64 Amine 4 Veteran 720 Curtail WeedDestroy Platoon Crossbow Escalade Weedmaster Solution Savage Weedone LV4	Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3	Selective broadleaf treatment	Ester and acid formulations of 2,4-D may provide a good alternative to amine formulations. A number of the 2,4-D products come premixed with other herbicides.	Amine formulations of 2,4-D are restricted for use within 60' of all water	Amine formulations cause irreversible eye damage and are highly toxic to rainbow trout. All 2,4-D products pose risks when applied near grapes and other sensitive crops.
Bromacil	Krovar 1 DF Hyvar	Zone 1	Nonselective pre-emergent grass and weed control	Krovar and Hyvar are premixed with diuron	Westside - Restricted for use Eastside - Krovar restricted for use within 60' of all water	Bromacil is potentially mobile in soil, use caution if rain is possible.
Bromoxynil	Buctril 2EC BroClean Brox 2E	Noxious and nuisance weed control, Zones 2 and 3	Selective broadleaf treatment	Effective broadleaf weed control without grass seed suppression	Westside - Restricted for use Eastside - Restricted for use within 60' of all water	Highly toxic to fresh water fish
Chlorsulfuron	Telar XP Landmark XP	Noxious and nuisance weed control, Zones 2 and 3	Selective broadleaf treatment	Product highly effective on Canadian thistle and horsetail. Landmark is premixed with Oust.	None	None
Clopyralid	Transline Curtail Pathfinder	Noxious and nuisance weed control, Zones 2 and 3	Selective broadleaf treatment	Curtail is premixed with 2,4-D, Pathfinder is premixed with triclopyr	Curtail and Pathfinder are restricted for use within 60' of all water because of mixture with other restricted herbicides.	Curtail contains 2,4-D amine which causes irreversible eye damage and is highly toxic to rainbow trout
Dicamba	Vanquish Veteran 720	Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3	Selective broadleaf treatment	Vanquish is the dicamba formulation without 2,4-D	Veteran 720 is restricted for use within 60' of all water because of 2,4-D amine content	Veteran 720 contains 2-4-D amine which causes irreversible eye damage and is highly toxic to rainbow trout
Dichlobenil	Norosac 4G Casoron	Ornamental planting beds	Pre-emergent weed control in ground cover beds. Post emergent control of grasses.	Highly effective for pre-emergent control of unwanted weeds in ornamentals	Restricted for use within 60' of all water	Dichlobenil is highly toxic to aquatic insects
Diflufenzopyr	Overdrive	Noxious and nuisance weed control, Zones 2 and 3	Selective broadleaf treatment	None	None	None
Diuron	Karmex Diuron 4 L Diuron 80 DF	Zone 1	Nonselective pre-emergent grass and weed control	Cost effective weed control for Zone 1 in Eastern Washington	Westside - Restricted for use Eastside - Restricted for use within 60' of all water	Highly toxic to fish.
Flumioxazin	Payload	Zone 1	Nonselective pre-emergent grass and weed control	Second year of use in zone 1, still evaluating	Restricted for use within 60' of all salt water	Highly toxic to estuarine invertebrates
Fluroxypyr	Vista	Noxious and nuisance weed control, Zones 2 and 3	Selective broadleaf treatment	None	None	Highly toxic to Eastern Oyster, high surface runoff potential
Fosamine	Krenite S	Tree and brush control in Zones 2 & 3	Selective broadleaf treatment	Effective broadleaf tree control without visual impacts	None	None
Glyphosate	Roundup Pro Razor Pro Buccaneer Aquaneat Rodeo Aquamaster	Zone 1, spot spray around shrub and tree plantings, aquatic weed control (Rodeo, Aquamaster)	Nonselective control of all vegetation	Rodeo, Aquamaster and Aquaneat are approved for use in or over water. Aquatic versions of glyphosate products are approved for use with NPDES permit.	None	None
Imazapyr	Arsenal Habitat	Zone 1	Pre and post-emergent non-selective control of all vegetation	Habitat is an aquatic version of Arsenal - good alternative to glyphosate in certain cases	None	High surface runoff potential, potentially mobile in soil if rain is possible.
Isoxaben	Gallery 75DF	Turf & Ornamental	Pre-emergent weed control in ground cover beds	Works well by itself or with Ronstar	Restricted for use within 60' of all water	High surface runoff potential
Metsulfuron-methyl	Escort XP Metsulfuron Methyl 60 DF	Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3	Selective broadleaf and conifer treatment	None	None	None
Norflurazon	Predict	Zone 1	Pre-emergent Weed control in Zone 1 and ground cover beds	Good Zone 1 product but may be difficult to keep in suspension	Restricted for use within 60' of all water	High surface runoff potential
Oryzalin	Oryzalin A.S. Surflan A.S	Zone 1 Ornamental planting beds	Pre-emergent Weed control in Zone 1 and ground cover beds	Product requires additional rinsing to thoroughly remove residues from empty container	Restricted for use within 60' of all water	Highly toxic to fish
Oxadiazon	Ronstar G Ronstar WSP	Turf & Ornamental	Pre-emergent weed control in ground cover beds	Works well by itself or with Gallery	Restricted for use within 60' of all water, gardens, plants bearing edible fruit	Highly toxic to fish
Pendimethalin	Pendulum 2G Pendulum Aqua	Zone 1 Turf & Ornamental	Nonselective Pre-emergent grass and weed control	None	Westside - Restricted for use Eastside - Restricted for use within 60' of all water	Highly toxic to fish, high potential for loss on eroded soil
Picloram	Tordon	Noxious and nuisance weed control, Zones 2 and 3	Selective broadleaf treatment	Highly effective for conifer and broadleaf weed control in Eastern Washington	Westside - Restricted for use Eastside - Restricted for use within 60' of all water	Highly mobile in soil and readily adsorbed through roots of desirable trees
Pyraflufen	Edict	Noxious and nuisance weed control, Zones 2 and 3	2,-4-D substitute, effective on Kochia, Russian thistle	Effective with Roundup for Kochia control	Restricted for use within 60' of all water	Irreversible eye damage, highly toxic to Rainbow Trout
Sulfentrazone	Portfolio	Zone 1	Nonselective pre-emergent grass and weed control	New product available for use in 2006	Westside - Restricted for use Eastside - Restricted for use within 60' of all water	High surface runoff potential, potentially mobile in soil if rain is possible.
Sulfometuron-methyl	Oust Landmark XP	Zone 1	Nonselective pre/post emergent grass and weed control	Landmark is premixed with Telar	None	None
Tebuthiuron	Spike 80DF	Zone 1	Nonselective pre-emergent grass and weed control	None	Westside - Restricted for use Eastside - Restricted for use within 60' of all water	High surface runoff potential, potentially mobile in soil if rain is possible.
Triclopyr Amine	Garlon 3A	Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3	Selective broadleaf treatment	None	None	Irreversible eye damage
Triclopyr Ester	Garlon 4 Crossbow Pathfinder	Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3	Selective broadleaf treatment	Works well for invert applications. Crossbow is premixed with 2,4-D, Pathfinder with clopyralid	Restricted for use within 60' of all water	Highly toxic to fish

Appendix C:

Olympic Region Area 4
Zone 1 Maintenance
Map 1 of 1



Legend

- Annual Cultivation
- Aquatic Glyphosate Only
- No Zone 1
- Zone 1
- State Routes
- Mile Post
- County Boundary
- City Limit
- Tribal Reservation
- National Park
- National Forest
- Olympic Region Area 4
- State Park
- Major Lakes
- Coast

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Miles

N

Washington State Department of Transportation

2009

Noxious Weed Identification

Designated for control in OL area 4:
(Grays Harbor, Mason, and Thurston County)

Tansy Ragwort/
Senecio jacobaea

Wild Chervil/
Anthriscus sylvestris

Knapweed sp./
Cenaurea sp.

Gorse/
Ulex europaeus

Purple Loosestrife/
Lythrum salicaria

Hawkweed sp./
Hieracium sp.

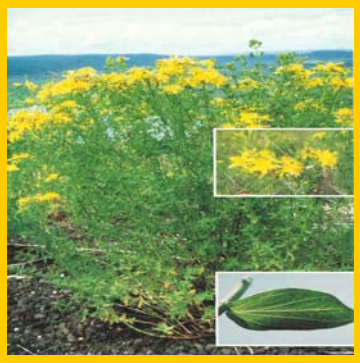
Nuisance Weed Identification

Nuisance weeds in OL area 4:
(Grays Harbor, Mason, and Thurston County)

Butterfly Bush/
Buddleha davidii

Poison Hemlock/
Conium maculatum

St. Johnswort./
Hypericum perforatum



Common Tansy/
Tanacetum Vulgare

Bull Thistle/
Cirsium vulgare

Canada Thistle/
Cirsium arvense

Nuisance weeds in OL area 4:
(Grays Harbor, Mason, and Thurston County)

Scotch Broom/
Cytisus scoparius

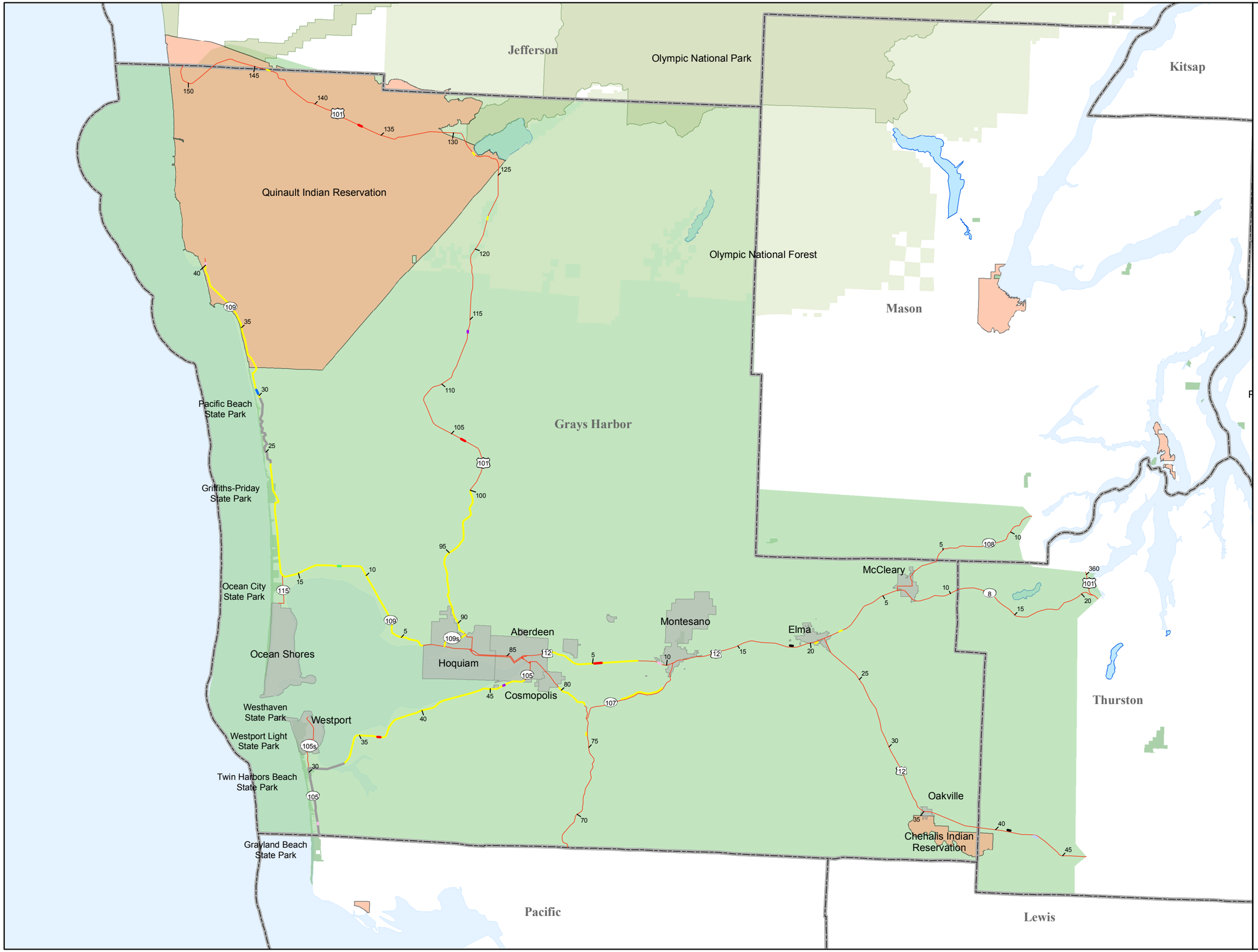
Wild Carrot/
Daucus carota

Himalayan Blackberry/
Rubus discolor

Mullein/
Verbascum thapsus

Appendix D:

Olymic Region Area 4
Noxious Weed Locations
Map 1 of 1



Legend

- Himayalan Knotweed
- Mouseear Hawkweed
- Orange Hawkweed
- Rush Skeletonweed
- Spotted Knapweed
- Wild Chervil
- Yellow Hawkweed
- Gorse
- Japanese Knotweed
- State Routes
- 5 – Mile Post
- County Boundary
- City Limits
- Tribal Reservation
- National Park
- National Forest
- Olympic Region Area 4
- State Park
- Major Lakes
- Coast

0 2.5 5
Miles

N

Washington State Department of Transportation

2009

Appendix E *Special Maintenance Area*

Table 3.0

Definitions:

Locations are distinguished between the sides of the highway by right shoulder (RS) or left shoulder/median (LS) in relation to either increasing (INC) mile markers or decreasing (DEC) mile markers

Description *- Brief explanation of special treatment required*

SR	Direction	Shoulder	BEG MP	END MP	Type	Description
T16 N. R5W W.M.					No. Oakville Waste Site	
Hicklin Rd.					Cloquallum Cr. Pit	
Elma Airport Rd.					Elma Airport Pit Site	
115	Both	RS	0.00	2.26	SMA	No Spray Area
109	Both	RS	0.00	3.30	City of Hoquiam	Maintain by city
109	Both	RS	15.70	21.65	SMA	No Spray Area
109	Both	RS	25.47	25.64	SMA	No Spray Area
109	Both	RS	30.43	32.41	SMA	No Spray Area
109	Both	RS	32.07	40.46	Quinault Indian Reservation	Limited Herbicide
108	Both	RS	0.00	2.21	City of Mccleary	Maintain by city
108			4.50		Maxwell Hill Pit	
107	Both	RS	7.37	7.97	City of Montesano	Maintain by city
105	DEC	RS	35.95	35.85	SMA	No Spray Area
105	Both	RS	29.72	30.27	Twin Harbors Beach State Park	
105	Both	RS	46.62	46.87	City of Aberdeen	Maintain by city
105	Both	RS	47.23	48.76	City of Aberdeen	Maintain by city
105			32.10		Bay City Storage Site	
105			35.00		Ocosta Flats Stockile Site	
101	INC	RS	121.03	121.80	Olympic National Forest	No Spray Area
101	INC	RS	123.38	125.53	Natural Area	No Spray Area
101	INC	RS	129.62	129.80	Natural Area	No Spray Area
101	INC	RS	361.52	361.80	Jct. SR8/US101 I/C	
101	DEC	RS	121.29	121.03	Olympic National Forest	No Spray Area
101	DEC	RS	121.80	121.58	Olympic National Forest	No Spray Area
101	DEC	RS	125.50	123.38	Natural Area	No Spray Area
101	DEC	RS	129.82	129.70	Natural Area	No Spray Area
101	DEC	RS	361.67	361.52	Jct. SR8/US101 I/C	
101	Both	RS	80.40	81.72	City of Cosmopolis	Maintain by city
101	Both	RS	81.72	85.78	City of Aberdeen	Maintain by city
101	Both	RS	85.78	89.40	City of Hoquiam	Maintain by city
101	Both	RS	91.21	91.33	City of Hoquiam	Maintain by city
101	Both	RS	94.40	100.00	Hoquim Watershed	No Spray Area
101	Both	RS	118.12	119.12	Olympic National Forest	No Spray Area
101	Both	RS	125.55	151.47	Quinault Indian Reservation	Limited Herbicide

Table 3.0

Definitions:

Locations are distinguished between the sides of the highway by right shoulder (RS) or left shoulder/median (LS) in relation to either increasing (INC) mile markers or decreasing (DEC) mile markers

Description *- Brief explanation of special treatment required*

SR	Direction	Shoulder	BEG MP	END MP	Type	Description
101	Both	RS	128.96	129.30	Natural Area	No Spray Area
101	Both	RS	146.80	146.87	Conservation Area	No Spray Area
101	Both	LS	361.80	362.11	Water System	No Spray Area
101			74.34		North River Pit Site	
101			89.00		Bernard Cr. Stockpile	
101			100.00		Oxbox Pit Site	
101			104.49		Axford Prairie Storage	
101			109.20		Humptulips Pit Site	
101			109.20		Lumis Gravel Bar	
101			110.00		Humptulips Waste Site	
012	INC	RS	6.45	6.55	SMA	No Spray Area
012	INC	RS	9.15	9.62	Devonshire Rd. I/C	
012	INC	RS	10.06	10.86	SR 107 I/C	
012	INC	RS	12.42	12.52	Monte Brady Rd. I/C	
012	INC	RS	12.90	13.40	Weight Station	
012	INC	RS	20.07	20.60	3rd St. I/C	
012	INC	RS	20.80	20.99	SR 12 I/C	
012	DEC	RS	9.53	8.94	Devonshire Rd. I/C	
012	DEC	RS	10.75	9.86	SR 107 I/C	
012	DEC	RS	12.61	12.50	Monte Brady Rd. I/C	
012	DEC	RS	13.38	12.86	Weight Station	
012	DEC	RS	20.45	19.98	3rd St. I/C	
012	DEC	RS	20.98	20.65	SR 12 I/C	
012	Both	RS	0.00	0.62	City of Aberdeen	Maintain by city
012	Both	RS	21.30	21.70	City of Elma	Maintain by city
012	Both	RS	34.92	35.50	City of Oakville	Maintain by city
012			30.10		H12 Gibson Cr. Pit Site	
012			35.14		Oakville Stockpile Site	
008	INC	RS	0.00	0.28	SR 12 I/C	
008	INC	RS	1.58	2.33	Rest Area	
008	INC	RS	7.32	7.97	Mox Chehalis I/C	
008	DEC	RS	0.16	0.00	SR 12 I/C	
008	DEC	RS	7.74	7.11	Mox Chehalis I/C	
008	DEC	RS	17.86	17.58	Wilson Rd. I/C	
008			10.10		Dierick Pit Site	
008			16.11		Rock Candy Mt. Pit Site	
008			18.20		Summit Lake Stockpile Site	

Washington State Department of Transportation

Integrated Vegetation Management Record

Org. Code	County	Date		Vegetation Management Zone(s)
435420	Grays Harbor	8/7/2006		☒ Zone 1 ☒ Zone 2 ☐ Zone 3

Area: SR 101 MP 104 to MP 137 Location:

Check Appropriate Boxes: ☒ NB ☐ EB ☒ SB ☐ WB ☒ Roadside ☒ Shoulder ☐ Median ☐ Landscaped Area ☐ Rest Area ☐ Park-n-Ride ☐ Interchange ☐ Bridge ☐ Ramp ☐ Mitigation Site ☐ Stormwater ☐ Yard/Stockpile Third Party Damage: ☐ Yes Sensitive Sites: ☐ Aquatic ☐ Wetlands

Target: ☒ Noxious Weeds ☐ Nuisance Weeds ☐ Brush/Trees ☐ Hazard Tree ☐ Other

List Target/Species: Orange Hawkweed

Reason for Action:
☒ Noxious Weeds ☐ Nuisance Weeds ☐ Fire Prevention ☐ Restore Native Veg. ☐ Zone 1 Pilot ☐ Aesthetic
☐ Site Distance ☐ Hazard Vegetation ☐ Customer Request ☐ Enhance Vegetation ☐ Slope Stabilization ☐ Other

Long term IVM plan (Describe goals/objectives and a step-by-step approach over time)

To control and eradicate this weed from zones 1 & 2.This was the first treatment this year but we are seeing good results from the previuos treatments from the year before.

Approximate Acres to Accomplish: 1.5

Activities		Planned date of Treatment	Actual date of Treatment
Manual	☐ Digging ☐ Pulling ☐ Planting ☐ Lopping ☐ Scalping ☐ Other		
Mechanical	☐ Aerial Saw Work ☐ Tractor Brush Cutter ☐ Mower/Chain ☐ Manual Brush Cutting ☐ Tractor Mower ☐ Other		
Bio-Control	☐ Insects ☐ Pathogens ☐ Parasites Type/Species		
Cultural	☐ Burning ☐ Grading ☐ Seeding ☐ Fertilizing ☐ Grazing ☐ Soil Amendment ☐ Other		
Chemical	3119456 Record Number		8/7/2006

#1 Evaluation and Date

#2 Evaluation and Date

#3 Evaluation and Date

Pesticide Application

Main Menu | Print | New Record | Form 8420 | List View | Blank Record | Delete Record | Find Record

Org. Code	County	Date of Application	Start / Finish	ICP	Stores Issue Ticket Number(s)
415520	King	10/13/2006	Start 12:30 ○ AM ◉ PM Finish 14:00 ○ AM ◉ PM	051A	F42735/F42733/42734

Area
SR 99 MP 25.12 to MP 26.01 and MP _____ to MP _____ and MP _____ to MP _____ and MP _____ to MP _____

Check Appropriate Boxes
☒ NB ☐ EB ☐ SB ☐ WB
☐ Roadside ☒ Shoulder ☐ Median
☐ Landscaped Area ☐ Rest Area ☐ Park-n-Ride
☐ Interchange ☐ Bridge ☐ Ramp
☐ Yard/Stockpile
☒ Spot Spray ☒ Blanket Spray ☐ Banded Width
☐ Aquatic ☐ Wetlands

☐ Weeds ☒ Noxious Weeds ☐ Disease
☐ Brush ☐ Insects ☐ Other
List Pest(s): Common Reed grass, Japanese knotweed, Blackberries

Start Weather Conditions
Temperature 54 °F(°C) Wind (Direction From) NW Wind (Range) 2 mph(km/h)
○ Sunny ◉ Broken ○ Overcast No Rain ○ Light Scattered Showers ○ Hard Showers

Finish Weather Conditions
Temperature 60 °F(°C) Wind (Direction From) NW Wind (Range) 4 mph(km/h)
◉ Sunny ○ Broken ○ Overcast No Rain ○ Light Scattered Showers ○ Hard Showers

Tank No.	Material Name	Material Type	EPA Reg. No.	Lot Number	Product Per Acre (hectare)	Unit	Total Daily Usage	Unit
1	Water	Carrier	----------	Spokane St.	100	Gal	50	Gal
1	Aquamaster	Pesticide	524-343	MTR00805AJ	96	Ozl	48	Ozl
1	MSO	Adjuvant	----------	77562	32	Ozl	16	Ozl
1	Turf Trax	Adjuvant	----------	34294	32	Ozl	16	Ozl

Total 0.50 **Acres(hectares) Treated at** 100 **gallons(liters) of spray per acre(hectare).**

Equipment Number	Tank Size	Calibration Date	Vehicle Speed	Nozzle Pressure	Width of Spray Pattern
21A36-5	1 200 2 ____ 3 ____ 4 ____ 5 ____	09/25/2006	n/a mph(km/h)	5 PSI(kPa)	N/A Feet(meter)

☐ Handspreader ☐ Backpack ☒ Handgun ☐ Fixed Nozzle ☐ Boom ☐ Other (Specify) _____
☒ Tank Mix (Conv.) ☐ Injection ☐ Invert

Operator Name	Operator Pesticide License No.	Operator Signature	Driver Name
Gabriel Olivas	52698		Richar Blair

Remarks
No water was present at the time of spray.

Buffer Truck Driver's Name

Pesticide Sensitivity Registration Applies: ☐ Yes ☒ No

Contact

Division of Emergency Management (1-800-258-5990)

Additional Notes

DOT Form 540-506 EF Revised 9/2001

Distribution: OIC Maint. Operator Region File
Send OSC Copy Within 5 Days

Osl= Ounces Dry Lb= Pound Osl= Ounces Liquid Ga= Gallon Pt=Pint Qt= Quart
g= gram kg=kilogram ml=Milliliter L= Liter

Entity	Mailing Address	Contact Person	Title	Phone	E-Mail
City of Aberdeen	200 E Market St. Aberdeen, WA 98520	Larry Bledsoe	Public Works Director	(360) 537-3228	pwadmin@aberdeeninfor.com
City of Hoquiam		Brian Shay	Public Works Director	(360) 532-5700 Ext. 243 Fax (360) 538-0938	bshay@cityofhoquiam.com
City of Cosmopolis	1300 First St. Cosmopolis, WA 98537	Darrin Rains	Public Works Director	(360) 532-9230 Fax: (360) 532-9215	
City of Montesano	112 N Main St. Montesano, WA 98563	Mike Wincewicz	Public Works Director	(360) 249-3939	mwincewicz@montesano.us
City of Elma	202 W. Main St. Elma, WA 98541	Jim Starks	Public Works Director	(360) 482-4960 Fax: (360) 482-4960	starksj@techline.com
City of McCleary	100 South 3rd St. McCleary, WA 98557	Busse Nutley	City Administrator	(360) 495-3200	bussen@cityofmccleary.com
City of Oakville	204 Maint St. E. Oakville, WA 98568	John Ruymann	Major	(360) 273-8916 Fax: (360) 273-5120	oakvillecityhall@comcast.net
City of Ocean Shores		Ken Lanfear	Public Works Director	(360) 289-2754	klanfear@osgov.com
City of Westport	740 N. Montesano St. Westport, WA 98595	Stephen J. Spring	Public Works Director	(360) 268-0835	public_works@ci.westport.wa.us
Quinault Indian Reservatiojn	807 5th. Ave. Taholah, WA 98587	Connie Wilson	Department Planning Manager	(360) 276-8215 Fax: (360) 276-0076	cwilson@quinault.org
Olympic National Forest	353 South Shore Road Quinault, WA 98575	Nancy Petrick		(360) 288-2525	mailroom_rs_olympic@fs.fed.us
Grays Harbor County	P.O. Box R Elma, WA	Nancy Ness	Vegetation Cooridnator	(360) 482-2265 Fax: (360) 482-2662	nessn@cahnrs.wsu.edu
Thurston County	9605 Tilley Rd. SW Olympia, WA 98512	Rick Johnson	Weed Board Coordinator	(360) 786-5576 Fax: (360) 786-5577	johnsor@co.thurston.wa.us